From: "Menachery, Vineet D" <vineet@email.unc.edu>

**Sent:** 02/13/2017 8:02:18 PM (-08:00)

To: "Sheahan, Timothy Patrick" <sheahan@email.unc.edu>; "Baric, Ralph S"

<rbaric@email.unc.edu>

Cc: "Anthony, Simon J." <sja2127@cumc.columbia.edu>; "Yount, Boyd L Jr"

<br/><byount@email.unc.edu>; "Graham, Rachel" <rigraham@email.unc.edu>; "Jonna Mazet" <jkmazet@ucdavis.edu>;

"Tracey Goldstein" <tgoldstein@ucdavis.edu>; "Kirsten Gilardi" <kvgilardi@ucdavis.edu>

**Subject:** Re: New 2b spike sequence **Attachments:** PDF-2386 Alignment.pdf

Since everyone is doing it.

Here is the alignment of known ACE2 contact residues. I did this by eye based on Rachel's alignment, so it might be rough, but there do seem to be some hot spots of changes common between HKU3, SHC014, and the new virus.

From: Sheahan, Timothy Patrick

Sent: Monday, February 13, 2017 9:05 PM

To: Baric, Ralph S

Cc: Anthony, Simon J.; Menachery, Vineet D; Yount, Boyd L Jr; Graham, Rachel; Jonna Mazet; Tracey Goldstein; Kirsten

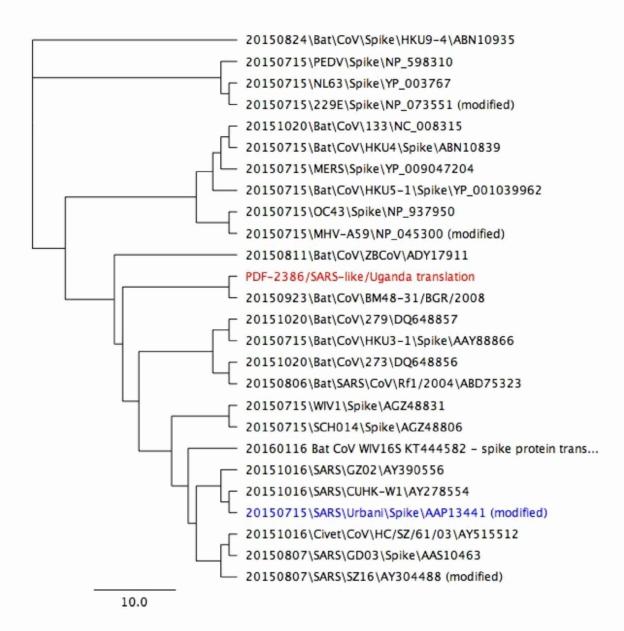
Gilardi

Subject: Re: New 2b spike sequence

Hi,

Like like me and Rachel were aligning at the same time. I echo her sentiments. This new sequence is quite far out on the tree. More distant than HKU3. See attached.

Τ



On Feb 13, 2017, at 7:35 PM, Baric, Ralph S < rbaric@email.unc.edu > wrote:

Hi Rachel and Tim, can you take a look at this new group 2b spike and compare it to sars, shc014, wiv1, wiv16 and HKU3. Thanks, Ralph

From: Anthony, Simon J. [mailto:sja2127@cumc.columbia.edu]

Sent: Monday, February 13, 2017 5:07 PM

To: Baric, Ralph S; Menachery, Vineet D; Yount, Boyd L Jr

Cc: Jonna Mazet; Tracey Goldstein; Kirsten Gilardi

Subject: New 2b spike sequence

Dear Ralph -

Thanks again for the call today. Per our discussion, here is a new spike sequence for you to evaluate. I think you'll like this one as it is SARS-like. :o)

As with the MERS-like virus, this was also found in a bat from Uganda. I am therefore Cc-ing Kirsten Gilardi as she leads all field activities there for UC Davis and was responsible for the collection of these samples.

## >PDF-2386/SARS-like/Uganda

ATGAAATTTTTCATCTTACTCAGTTTCTTGCCCTTTGCCACTGCCCAAGAAGGCTGTGG CATATTGAGTAACAAGAGCAAACCTGCTCTTACTCAACACTTATCATCTAGGAGAGGT TTTTACTACTTTGATGACACTTTTAGATCATCTGTGCGTGTTGTTGACTACAGGTTATTTC TTGCCCTTTAACAGTAATCTTACTGGTTATAGTTCAAGAAATGCAGTTACTGGACGGCT TATACAGTTTGATAACCCAAACATACCATTTAAAGATGGTTTGTATTTTGCCGCTACAG AAAGGTCCAACGTTATACGTGGTTGGATCTTTGGTTCTACGCTAGACAACACAACTCA GTCAGCTGTGCTTTTTAATAATGGTACGCACATTGTTATTAATGTGTGTAACTTTTATTT TTGCCAAGACCCTATGCTAACAGTGGCTAATGGTTCTCATTACAAATCTTGGGTTTTTC TCAATGCTACCAATTGCACATACAATCGTGTACATGCTTTTGAGATTGACCCTAGTTTA AATACAGGTGCCTTTATACATTTAAGAGAACATGTTTTTAGAAATGTGGATGGCTTTCT TTATGTCTACCATAATTATGAAAGAGCAAATGTTTACGACAACTTCCCATCAGGGTTTT CTGTCCTAAAACCTATACTCAAGTTACCTTTTGGCCTAAATATAACGCAGTTTAAAGTC ATTATGACTTTGTTTTCACCTACTACAAGTTCTTTCAATGCAGATGCTTCTGTTTATTTT GTAGGCCATTTAAAACCTCTCACTATGCTTGCTGAATTTGATGAAAACGGCACCATTAC TGATGCCGTTGATTGTTCTCAGGACCCTCTTTCTGAGCTAAAATGTACCACTAAAAGTC TTACTGTGGAAAAAGGAATTTACCAAACTTCAAACTTTCGTGTTTCACCTAGTACTGAA GTAGTAAGATTCCCTAACATAACAAACCTTTGTCCTTTTGGTCAAGTGTTCAATGCTTC AAATTTTCCTTCAGTTTATGCTTGGGAAAGGCTGCGCATTAGTGACTGCGTTGCAGACT ACTCAGTGCTTTATAATTCATCATCCTCTTTTTCGACATTCAAGTGTTACGGCGTTTCTC CTACTAAACTCAATGATTTGTGTTTTAGTAGTGTGTACGCTGACTACTTTGTCGTGAAG GGTGATGATGTTAGACAAATAGCTCCTGCGCAGACAGGTGTTATTGCTGATTATAATT ATAAGTTGCCAGATGATTTCACTGGCTGCGTTTTAGCCTGGAATACTAATTCTGTGGAT TCAAAGCAAGGTAATTTTATTACAGGCTTTTTAGACATGGGAAGATCAAACCTTATG AGCGCGATATTTCCAATGTTCTTTATAATTCAGCTGGTGGTACGTGTTCTTCCATTTCTC AGCTAGGCTGTTATGAACCACTTAAATCCTATGGTTTTACACCCACTGTTGGTGTTGGT TATCAACCATATAGAGTGGTTGTTCTTTCTTTTGAATTACTAAACGCACCTGCTACAGT GTGTGGCCCTAAAAAATCTACGGAACTTGTTAAGAACAAGTGCGTGAATTTTAATTTT AATGGACTGACAGGCACTGGTGTGCTTACTAGTTCTACTAAGAAGTTTCAGCCCTTTCA GCAATTTGGTCGTGATGTCAGACTTCACTGACTCGGTTAGGGACCCTAAAACGCTTG AAATTCTAGACATTTCACCTTGTTCTTATGGTGGTGTTAGTGTCATAACTCCTGGAACA AACACGTCTAAAGCAGTTGCTGTTTTGTACCAGGATGTCAATTGCACTGATGTTCCCAC AATGTTACATGTGGAACAGGTATCAACAGATTGGCGTGTTTACGCCCTTAGTGCAGAT GGCAACATGTTTCAAACACAAGCAGGTTGTCTTGTAGGAGCCACTTATGAGAATTCCA CTTATGAGTGTGACATACCGATTGGAGCTGGTATTTGTGCAAAATTCGGCTCTAATAAA CTCAGACAAGAATCTATAGTGGCTTACACCATGTCAATAGGTGAAGACCAGTCCATTG CTTACTCTAATAACACCATAGCCATACCAACTAATTTTAGTATTAGTGTAACCACTGAA GTACTACCTGTCTCCATGACTAAGACATCCGTGGATTGCAACATGTATATTTGTGGTGA TTCTACTGAGTGTAGCAATTTATTGCTACAGTATGGCAGTTTCTGTACACAACTTAATA GAGCACTTTCTGGTATTGCCGTCGAACAAGACAGAAATACTAGAGATGTGTTTGCACA GACTAAAGCTATTTACAAAACTCCTAACATCAAGGATTTTGGTGGCTTTAATTTTTCAC AAATATTACCAGACCCTAAGAAACCATCTTATAGGTCTTTTATTGAGGATTTGCTTTAT AACAAGGTCACACTATCTGATCCTGGTTTTATGAAGCAGTATGGTGATTGTTTGGGTGG TATAAACGCCAGAGACCTCATTTGCGCTCAAAAGTTCAATGGTCTTACTGTTTTGCCTC CCTTACTGACAGATGACATGATTGCTGCTTATACAGCCGCGCTCATTAGTGGCACCGCT ACGGCTGGTTACACTTTTGGAGCAGGTGCTGCACTTCAAATCCCATTTGCTATGCAAAT GGCATATAGGTTTAATGGCATAGGTGTTACTCAAAATGTGCTTTATGAGAACCAGAAA CAAATTGCTAATCAGTTTAACAATGCCATATCCAAAATTCAGGATTCGCTTACAACTAC

AAGTGCAGCCTTAGGTAAATTACAAGATGTGATAAACCAGAACGCTGTAGCTTTGAAT ACTCTTGTTAAACAATTAAGCTCCAATTTTGGTGCTATTTCAAGTGTTTTAAATGACAT AGACTTCAAAGCTTACAGACTTATGTTACACAGCAACTTATCAGAGCTGCTGAGATCA GAGCTTCTGCTAATCTTGCTGCTACTAAAATGTCAGAGTGTGTACTTGGGCAGTCTAAA AGAGTTGACTTTTGTGGAAAGGGTTATCACCTAATGTCTTTCCCACAAGCCGCACCACA TGGTGTTGTTTCTTGCATGTCACTTATGTGCCTTCGCAACAACAAACTTCACTACAG CACCGGCCATTTGTCACAATGGTAAGGCATACTTCCCTAGAGAAGGTGTTTTTGTTATG AATGGCACACACTGGTTCATTACACAAAGAAACTTCTATTCACCACAGGTTATCACTA CAGATAACACTTTTGAGTCAGGTAGTTGTGATGTCGTAATAGGCATCGTTAATAATAC AGTTTATGATCCGCTCCAACCAGAGCTTGAATCCTTTAAGCAGGAACTTGATAAATATT TTAAAAATCATACGTCACCAGACGTAGATCTTGGAGACATCTCAGGCATCAATGCCTC TGTCGTCGACATTAAAAAGGAAATTGCTCATCTAAATGAAATTGCTAAAAATTTAAAT GAGTCTCTTATAGACCTACAGGAATTAGGAAAATATGAACAGTACGTTAAATGGCCAT GGTACGTTTGGCTTGTAGCCGGCATCGTTGCCATTCTTATGTCTGTTATTATGC TTTGCTGCATGACCAATTGTTGCAGTTGCTTTAAAGGCATGTGCTCCTGTGGTTCTTGCT GCAAATTTGATGAAGATCATTCAGAACCCATCTTAAAGGGTGTCAAGTTACATTATCC **ATAA** 

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